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ABSTRACT

An examination of models which have been employed in making predictions about the interference effect is made. It is pointed out that investigators mainly have relied upon the paired-associate model borrowed from classical studies in the field of verbal learning. This basic paradigm, represented as A-B, A-C, A-B, has produced fairly consistent results with learning tasks consisting of words and nonsense syllables, but has not served as an effective model in making predictions when meaningful passages of prose have been involved. The possibilities of another model from verbal learning are studied. It is suggested that subjective organization, which has been useful in predicting retention in free recall tasks, may also have relevance for explaining the forgetting of prose material. The notion that retroactive interference or facilitation might be predicted on the basis of passage organization was suggested in a recent study in which an artificial structure was imposed on the prose materials by constructing passages on the basis of Venn diagrams. It is concluded that if prose materials having an inherent hierarchial structure are used in a study of retroaction, the same type of thing may happen between the original and interpolated learning phases. That is, recall may suffer if subjects are forced to rearrange the elements of an established hierarchical structure. (Author/CK)

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The lack of agreement in the findings of studies dealing with interference and prose learning suggests that it may be advisable to take a closer look at the particular models which have been employed in making predictions about the interference effect. For the most part, investigators have relied heavily upon the paired-associate model borrowed from classical studies in the field of verbal learning. This basic paradigm, represented as A-B, A-C, A-B, has produced fairly consistent results with learning tasks consisting of words and nonsense syllables, but has not served as an effective model in making predictions when meaningful passages of prose have been involved. Part of the problem, in addition to trying to draw a distinction between rote and meaningful learning, is trying to identify just what the stimulus and response elements are in a prose passage. In some studies they have been defined in terms of test questions based on the passages (Anderson and Myrow, 1970, Anderson, 1970). Other attempts at operationally defining these elements have included considering the subject of a sentence the stimulus and the predicate the response (Peairs, 1958). Not only is there a need to place much greater emphasis upon improving operational definitions in this type of research, but an effort should also be made to break away from our reliance upon the paired-associate model and consider other models that may have more relevance to what actually occurs in the process of forgetting. This does not necessarily mean that interference cannot be explained in terms of the retroaction paradigm, but that variables such as similarity may have to be considered in a new light.

In order to demonstrate that we need not restrict our thinking to one basic

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model, it may be interesting to consider the possibilities of another model from verbal learning that may be much more reasonable when considering prose materials. It is suggested that subjective organization, which has been useful in predicting retention in free recall tasks, may also have relevance for explaining the forgetting of prose material. There appears to be sufficient evidence now that subjects do organize in some way what they read (Frase, 1969).

Before considering how the interference effect occurs in a retroaction experiment, it seems essential that an attempt be made to establish whether or not subjects develop organizational strategies for remembering what they learn from reading the original passage and whether or not these strategies are similar to those developed in a free recall task. In other words, does the interdependence hypothesis formulated by Tulving (1962) help to explain the retention of prose material? Does the subject develop higher-order S-units so that within each unit the recall of one word influences the recall of others? When a subject reads a passage, does he organize what he has read into conceptual categories as part of a general retrieval strategy? Although learning the content of a passage is certainly different from learning a list of words, it seems reasonable to suspect that when subjects are faced with the need to retain passage content over a period of time, they will attempt to identify words in the passage that are essential for retrieval of the important information. If this occurs in the same way that it appears to in free recall (Bower, 1970), it is likely that the words recalled first may be those that identify major concepts or superordinate categories.

The notion that retroactive interference or facilitation might be predicted on the basis of passage organization was suggested in a recent study conducted by the author (Anderson, 1970). In this experiment an artificial structure was imposed on the prose materials by constructing passages on the basis of Venn

diagrams (Dawes, 1964). This particular methodology was employed as a way of operationally defining the variable of similarity. The passages were written so that the subject could impose an organization on each one that would aid him in remembering its content. Each passage was structured on the basis of two or three main sets which could be organized by the subject as higher-order memory units and retrieved later as separate clusters. In learning the passage the subject could use the name of the main set as a mediator or common associate. The name assigned to each set and subset in the passage was associated with certain attributes, and each subset was considered to possess all the attributes of the larger sets to which it belonged. In this way associations could be formed between the name of the main set and all of its subsets and all of the attributes assigned to each set and subset. Through practice the subject could store more information in the form of higher-order memory units and develop an organization that would aid him in remembering the content of the passage in the form of major clusters. Since the name of each of the main sets represented a superordinate category it could be used as a means of cuing the recall of subordinate categories within it along with their attributes. These major set names thus could mediate the recall of the entire passage and serve as the principal components of a general retrieval strategy.

The highly similar passage in the interpolated learning phase was based on a Venn diagram only slightly different from that used in original learning, while the dissimilar passage was completely different. As part of the final retention test subjects were asked to reconstruct the Venn diagram used in writing the original learning passage. Subjects who read the highly similar passage performed significantly better on this test. This could have resulted from their being allowed to maintain basically the same structural organization in each passage read. While subjects in the dissimilar condition were developing a whole new

organization for remembering the content of the interpolated passage, the organization they developed during the original learning phase may have been extinguished.

A finding such as this suggests that what is really needed in prose studies of this kind is a means of determining just what is happening at the time the subject reads the original and interpolated passages. If the subject does indeed formulate some type of organization at each stage it would be helpful to know something about its nature. It would be of considerable interest to know whether or not the organizational structure developed by the subject resembles the structure imposed on the materials by the experimenter.

The set relations methodology described above is an attempt at finding a means of doing this. For instance, subjects could be asked to represent their schemes for remembering passage content by constructing their own Venn diagrams at each stage in the experiment. Other procedures, such as a free recall test, could be given after each passage using a list that would include all the names and identifying attributes found in the passage. With each practice trial in reading the passage there should be an increasing amount of clustering for those items that are related to each other through their set relations structure. A free association test could also be used to determine if other words which are part of the same logical structure as the stimulus word would be given as associates. To some extent these methods should provide a means of determining how associative structures change during each phase of a retroaction experiment and how highly developed the structures are at each point. It may be that a retrieval strategy may consist of a hierarchical arrangement of elements, some not even included in the passage itself.

Instead of focusing so much attention upon similarity as an important variable in predicting interference, as is done using the paired associate model, it

may be more useful to try to explain forgetting in terms of what factors affect the subject's ability to develop stable clusters or groupings. If subjects organize prose material in the same way they organize a list of words in a free recall task it is likely that one factor may be the extent to which stable clusters are allowed to develop through practice. Using groupings of unrelated concrete nouns in a free recall experiment, Bower (1970) found that whether they originated with the experimenter or the subject recall decreased if new groupings were imposed on the subject on subsequent trials. If prose materials having an inherent hierarchical structure are used in a study of retroaction it seems reasonable to expect that the same type of thing may happen between the original and interpolated learning phases. That is, recall may suffer if subjects are forced to rearrange the elements of an established hierarchical structure.

What has been suggested here is that the research which has been done on subjective organization may have a great deal of relevance for explaining the retention of prose material. If organizational factors are found to play an important role in the retention of prose, it would seem that investigators interested in the interference effect will be in a much better position to evaluate the role of similarity as an important variable. However, before it can be determined how one passage of prose may influence the retention of another, more must be known about the nature of retrieval strategies for individual passages. In the beginning stages of this research it seems that these organizational processes might best be studied by employing experimental materials with a pre-determined structure. This would help to answer some important questions, such as whether or not subjects tend to organize prose material in a way similar to that imposed by the experimenter and whether the organization is of a hierarchical nature. A number of questions such as this need to be answered before much can be said about how this research will ultimately affect the design of instructional materials.

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